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UPDATE ON THE STATUS OF THE WEST VALLEY DEMONSTRATION PROJECT

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ABSTRACT

From 1966 to 1972, under an Atomic Energy Commission (AEC) license, Nuclear Fuel Services (NFS) reprocessed 640 metric tons of spent fuel at its West Valley, New York, facility, the only commercial spent fuel reprocessing plant in the U.S. The facility shut down in 1972, for modifications to increase its seismic stability and to expand its capacity. In 1976, without restarting the operation, NFS withdrew from the reprocessing business and returned control of the facilities to the site owner, the New York State Energy Research and Development Authority (NYSERDA). The reprocessing activities resulted in about 2.3 million liters (600,000 gallons) of liquid high-level waste (HLW) stored below ground in tanks, other radioactive wastes, and residual radioactive contamination. The West Valley site was licensed by AEC, and then the U.S. Nuclear Regulatory Commission (NRC), until 1981, when the license was suspended to execute the 1980 West Valley Demonstration Project (WVDP) Act. The WVDP Act outlines the responsibilities of the U.S. Department of Energy (DOE), NRC, and NYSERDA at the site, including the NRC's responsibility to develop decommissioning criteria for the site. The Commission published the final policy statement on decommissioning criteria for the WVDP at the West Valley site after considering comments from interested stakeholders. In that regard, the Commission prescribed the License Termination Rule (LTR) criteria for the WVDP at the West Valley site, reflecting the fact that the applicable decommissioning goal for the entire NRC-licensed site is compliance with the requirements of the LTR. This paper will describe the history of the site, provide an update of the status of the decommissioning of the site and an overview of the technical and policy issues facing Federal and State regulators and other stakeholders as they strive to complete the remediation of the site.

INTRODUCTION

From 1966 to 1972, under an AEC license, NFS reprocessed 640 metric tons of spent fuel at its West Valley, New York, facility, the only commercial spent fuel reprocessing plant in the U.S. The facility shut down in 1972, for modifications to increase its seismic stability and to expand its capacity. In 1976, without restarting the operation, NFS withdrew from the reprocessing business and returned control of the facilities to the site owner, NYSERDA. The reprocessing activities resulted in about 2.3 million liters (600,000 gallons) of liquid HLW stored below ground in tanks, other radioactive wastes, and residual radioactive contamination. The West Valley site was licensed by AEC, and then NRC, until 1981, when the license was suspended to execute the 1980 WVDP Act, Pub. L. 96-368. The WVDP Act authorized DOE to: (1) carry out a liquid-HLW management demonstration project; (2) solidify and transport the HLW that exists at the site; (3) dispose of low-level waste (LLW) and transuranic waste produced by the WVDP, in accordance with applicable licensing requirements; and (4) decontaminate and decommission facilities used for the WVDP, in accordance with requirements prescribed by NRC. NYSERDA is responsible for all site facilities and areas outside the scope of the WVDP Act. Although NRC suspended the license covering the site until completion of the WVDP, NRC has certain authority, under the WVDP Act to ensure public health and safety, that include prescribing decommissioning criteria for the tanks and other facilities in which the HLW solidified under the project was stored, the facilities used in the solidification of the waste, and any material and hardware used in connection with the WVDP; site monitoring activities; and informal review and consultation with DOE. It should also be noted that DOE is not an NRC licensee and DOE's decommissioning activities for the WVDP at the West

Valley site are conducted solely under the WVDP Act and not the Atomic Energy Act (AEA). NYSERDA is the licensee for the West Valley site and DOE is acting as a surrogate for NYSERDA until the NYSERDA license is reinstated at the end of the WVDP.

STATUS OF DECOMMISSIONING

The DOE has completed removing HLW from underground tanks at the site, vitrifying that HLW, and is currently storing it onsite for eventual offsite disposal in a Federal repository. In addition to the vitrified HLW, the WVDP operations have also produced LLW and transuranic waste which, under the Act, must be disposed of in accordance with applicable licensing requirements. Besides the HLW at the site, the spent fuel reprocessing and waste disposal operations resulted in a full range of buried radioactive wastes and structural and environmental contamination at the site.

OVERVIEW OF TECHNICAL AND POLICY ISSUES

In 1989, DOE and NYSERDA began to develop a joint Environmental Impact Statement (EIS) for project completion and site closure, and to evaluate waste disposal and decommissioning alternatives. Because the WVDP Act authorizes NRC to prescribe decommissioning criteria for the project, NRC agreed to participate as a cooperating agency under the National Environmental Policy Act (NEPA) on the development of the EIS. The draft EIS was published in 1996. The WVDP Act does not address termination of the NRC license for the site, or portions thereof. Any such license termination will be conducted (if license termination is possible and pursued) under the AEA of 1954, as amended. If NYSERDA pursues either full or partial license termination of the NRC license, NRC will need to conduct an additional environmental review to determine if an EIS is necessary to support license termination.

After public review of the draft EIS, the WVDP convened the West Valley Citizen Task Force (CTF), in early 1997, to obtain stakeholder input on the EIS. The CTF recommendations for the preferred alternative in the EIS were completed in July 1998. The CTF meets monthly, is comprised of a wide variety of local stakeholders, including the Seneca Indian Nation, and provides comments to DOE and NYSERDA and the regulators on activities at West Valley.

NRC's LTR was published on July 21, 1997. The LTR prescribes decommissioning criteria which identify radiological criteria for unrestricted release (less than 25 mrem per year), for restricted release (less than 25 mrem per year with institutional controls and less than 100 mrem per year if institutional controls fail or 500 mrem per year if not technically feasible, prohibitively expensive or results in net public or environmental harm) and for alternate criteria (greater than the restricted release criterion for sites with restrictions in place up to 100 mrem/yr if certain other criteria are met).

In accordance with the NRC's authority under the WVDP Act, the Commission published a draft policy statement on decommissioning criteria for the WVDP at the West Valley site, for public comment on December 3, 1999. The final policy statement was developed, after considering the public comments on the draft, and published on February 1, 2002. The final policy statement recognizes that a flexible approach to decommissioning is needed both to ensure that public health and safety and the environment are protected, and to define a practical resolution to the challenges that are presented by the site. In that regard, the Commission decided to prescribe the LTR criteria for the WVDP at the West Valley site, reflecting the fact that the applicable decommissioning goal for the entire NRC-licensed site is compliance with the requirements of the LTR. However, the Commission recognizes that health and safety and cost-benefit considerations may justify the evaluation of alternatives that do not fully comply with the LTR criteria. For example, the Commission would consider an exemption allowing higher limits for doses on a failure of institutional controls if it can be rigorously demonstrated that protection of the public health and safety for future generations could be reasonably assured through more robust engineered barriers and/or increased long-term monitoring and maintenance. The Commission is prepared to provide flexibility to assure cleanup to the maximum extent technically and economically feasible. It should be noted that the LTR does contain provisions for alternate criteria, and Subpart N of 10 CFR Part 20 contains provisions for potential exemptions, with both alternatives based on a site specific analysis which demonstrates that public health and safety will be adequately protected with reasonable assurance. Exemptions to NRC regulations can be issued to NRC licensees if the Commission determines that the exemption is authorized by law and would not result in undue hazard to life or property. If the NRC license cannot be terminated in a manner that provides reasonable assurance of adequate protection of the public health and safety, then the appropriate Commission action may be to require a long term or even a perpetual license for an appropriate portion of the site until an acceptable alternative is developed to permit license termination. If a long term or perpetual license is necessary for any portion of the site, it is the Commission's intent that that portion of the site will be decontaminated in the interim to the extent technically and/or economically feasible. If a long-term or perpetual license is determined to be appropriate, the NRC has not taken a position on which entity should be the long-term licensee as that decision, as well as decisions regarding long term financial contributions, should be made pursuant to negotiations involving DOE, New York, and possibly the U.S. Congress. Also, under the WVDP Act, the NRC is only addressing the public health and safety aspects of decommissioning selected portions of the site. Other potential issues between DOE and NYSERDA concerning the West Valley site are not within NRC's authority to resolve.

Based on the public comments received in response to the request for comments on the policy statement, the Commission addressed the issue of waste incidental to reprocessing (WIR) at West Valley in the Final Policy Statement. The Commission decided to issue incidental waste criteria to clarify the status of and classify any residual wastes present after cleaning of the HLW tanks at West Valley. Previously, the NRC provided advice to DOE concerning DOE's classification of certain waste as incidental waste for clean-up of HLW storage tanks at both Hanford and Savannah River. The Commission decided that the most recent advice provided to DOE for the classification of incidental waste at Savannah River, with some additional modifications, provides the appropriate criteria to be applied to West Valley. Specifically, the Commission is providing the following criteria for classification of the incidental waste (which will not be deemed to be HLW) at West Valley: (1) the waste should be processed (or should be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical; and (2) the waste should be managed, so that safety requirements comparable to the performance objectives in 10 CFR Part 61 Subpart C, are satisfied. The dose methodology used in 10 CFR Part 61 Subpart C is different from that used in the newer 10 CFR Part 20 Subpart E. However, the resulting allowable doses are comparable and NRC expects DOE to use the newer methodology in 10 CFR Part 20 Subpart E. Part 61 is based on International Commission on Radiological Protection Publication 2 (ICRP 2) and Part 20 is based on ICRP 26. Consistent with the overall approach in applying the LTR to the WVDP and to the entire NRC-licensed site following conclusion of the WVDP, the resulting calculated dose from the incidental waste is to be integrated with all the other calculated doses from the residual radioactive material at the NRC-licensed site to ensure that the LTR criteria are met. This is appropriate because the Commission does not intend to establish separate dose standards for various sections of the NRC-licensed site. As stated above, applying the LTR, the total annual dose to an average member of the critical group for the site, including the resulting doses from the incidental waste, should be less than or equal to 25 mrem/yr TEDE. The Commission is not establishing a separate dose standard for the incidental waste such that the average member of the critical group would potentially receive a dose of 25 mrem/yr TEDE from the rest of the NRC-licensed site and 25 mrem/yr TEDE from the incidental waste.

In 2001, DOE decided to separate this EIS into two separate EISs to address: (1) near-term decontamination and waste management at the WVDP; and (2) decommissioning, long-term monitoring, and stewardship of the site. NRC is not a Cooperating Agency on the decontamination and waste management EIS because the Commission is not prescribing criteria for decontamination activities considered in this EIS. As noted above, NRC will be a Cooperating Agency on the EIS for decommissioning under the WVDP Act. In April

2003, DOE held its scoping meetings for the decommissioning EIS. DOE is examining five alternatives in the EIS: unrestricted site release, partial site release without restrictions, partial site release with restrictions, monitor and maintain under current operations, and no action. The scoping process requested input on the following specific areas: impacts to the general population, environmental impacts, transportation impacts, impacts from postulated accidents, potential costs, environmental justice (potential disproportionately high and adverse effects on low-income and minority populations), potential Native American concerns, irretrievable and irreversible commitment of resources, short term and long term land use impacts, ability of alternative to meet the Comprehensive Environmental Response, Compensation and Liability Act risk range, ability of alternatives to satisfy the decommissioning criteria, compliance with Federal, State and local requirements, identification of Derived Concentration Guidelines Limits, influence and potential interactions of any wastes remaining, unavoidable adverse impacts, issues associated with long term site stewardship, long term health and environmental impacts, long term site stability, WIR, and disposition of wastes. DOE's schedule calls for a draft EIS in early 2004 and a final EIS in late 2004.

The decommissioning of the West Valley site is made more challenging by the involvement of multiple Federal and State regulators. These regulators include the: NRC, U.S. Environmental Protection Agency (EPA), New York State Department of Environmental Conservation, New York State Department of Health, and New York State Department of Labor. The U.S. General Accounting Office issued a report in 2001, that recommended NRC and EPA, in coordination with New York State, agree on how their different regulatory cleanup criteria should apply to the site. On November 27, 2001, the involved regulatory agencies met to discuss applicable cleanup criteria and regulatory roles and responsibilities for the West Valley site. In this meeting, the regulators agreed to develop a communication plan that: 1) identifies applicable cleanup requirements and expectations of the regulating agencies that need to be addressed in decommissioning the West Valley site, and 2) describes the roles and responsibilities of these involved regulatory agencies. On March 27, 2002, these agencies issued a Regulators Communication Plan that addresses these points. The Regulators Communication Plan is a living document and is designed to assist DOE and NYSERDA in developing a better understanding of the applicable regulatory cleanup requirements and expectations that need to be considered in the decommissioning of the West Valley site. The Regulators Communication Plan should also assist in the scoping of issues that may need to be considered in the DOE-NYSERDA EIS for the decommissioning of the WVDP. The regulators plan to meet periodically throughout the decommissioning of the WVDP to discuss and resolve issues of mutual interest.

Shortly after the Regulators Communication Plan was developed, NRC staff began developing an implementation plan that would describe the NRC's decommissioning process under the WVDP Act, would describe the NRC's decommissioning and license termination process under the AEA and identify NRC decisions under both the WVDP Act and the AEA. The implementation plan is also a living document and recognizes DOE is not an NRC licensee and is not regulated by the NRC. Nonetheless the implementation plan outlines how NRC will meet its obligations under the WVDP Act. The implementation plan identified the need for both DOE and NYSERDA to submit decommissioning plans (DPs) that will coincide with the completion of the DEIS. By reviewing all relevant information in the DPs and EIS, NRC will be able to determine whether the preferred alternative in the EIS meets the LTR and thus fulfill the Commission's policy statement. It is the NRC's expectation that the Decommissioning Plans will follow established NRC guidance and the NRC's review will

follow established staff guidelines. The staff plans to document the review of the DP in a safety evaluation report.

SUMMARY

The West Valley site is an extremely complex site involving numerous regulatory agencies. Close communication among all the regulators is vital. The EIS development is an essential step in moving forward with the cleanup of the site and eventual license termination. The entire process, including the EIS development and eventual license termination, will require input from all stakeholders, including DOE, NYSERDA, the regulators, the CTF, and other interested parties to resolve these complex technical and policy questions.